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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,817	01/16/2004	Richard L. Marks	SONYP031/SCEA03010US00	6584

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EXAMINER	
WANG, KENT F	
ART UNIT	**PAPER NUMBER**
2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/758,817	MARKS, RICHARD L.	
	Examiner	Art Unit	
	Kent Wang	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/24/05 & 05/04/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The references listed on the Information Disclosure Statement (IDS) submitted on 01/24/05 and 05/04/05 have been considered by the examiner (see attached PTO/SB/08).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 9-14, 16-18, 20-25, 27-28, 30, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (US Patent 6,556,704) in view of Tuomi (US Patent 7,061,507).

Regarding claim 9, Chen discloses a method for adjusting image capture settings for an image capture device comprising the step of:

- identifying a scene (i.e. searching for qualified feature points; col. 3, lines 58 – 67);
- capturing an image of the scene (i.e. cameras are arranged to capture images; see figure 1 and col. 6 lines 40 - 57);

– and generating a depth mask of the scene from data defining the image of the scene (i.e. a foreground depth mask is generated using the depth map containing the foreground feature points; col. 4, lines 1 – 23).

Chen does not explicitly teach the step of adjusting pixel values corresponding to objects within any one or both of a foreground region and a background region of the captured image.

In same field of endeavor (depth mask), Tuomi teaches a method for generating a depth mask which include the step of adjusting pixel values (e.g. Z-value) corresponding to objects within any one or both of a foreground region and a background region of the captured image (see figure 21, col. 12, line 60 to col. 13, line 36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chen by adjusting pixel values with relating to the depth value or a Z-value. The depth information in the Z-buffer 2606 is primarily used during the rendering process to determine which pixel is in the foreground (see figures 21 and 26, and col. 16, lines 48 – 57). The motivation to do so would have benefit of reducing the amount of memory required for each pixel stored in a frame buffer because only the color values for the antialiasing mask operation need to be stored, thus reducing the size of the frame buffer (see col. 10, lines 57-61 of Tuomi).

Regarding claim 17, this claim differs from claim9 only in that claim 9 is method where claim 17 is apparatus. Tuomi clearly teaches "the bit value of the depth mask"

as recited in claim 17 (see col. 13 lines 7-36). Thus it is analyzed as previously discussed with reject to claim 9 above.

Regarding claim 25, this claim differs from claim 17 only in that the limitations "a computing device" and "a display device" are additionally recited. Chen teaches a computing device (112) and a display (114) (see figure 12 and col. 5, lines 56-67).

Regarding claim 10, Chen teaches segmenting the foreground (e.g. 63) and background (e.g. 62) of the scene as broad claimed language (see col. 2, lines 50-60).

Regarding claims 11 and 32, Chen teaches the data defining the image of the scene includes pixel data where each pixel is tagged with distance information (see col. 11, lines 16 - 31).

Regarding claim 12, Tuomi teaches the method operation of independently adjusting pixel values associated with the foreground region from pixel value associated with background region (see figure 26 and col. 15, line 38 to col. 16, line 56).

Regarding claim 13, Chen teaches an image capture device comprising a digital camera (col. 5, lines 47 – 55).

Regarding claim 14, Tuomi teaches displaying a portion of the image of the scene having adjustable pixel values (i.e. primary depth information of the pixel 2102 will change to the Z-value of the polygon; see col. 13, lines 4 – 36).

Regarding claim 16, Tuomi teaches the method operation of adjusting pixel values corresponding to objects within any one or both of a foreground region and a

background region of the captured image based upon bit values of the depth mask (see col. 11, line 48 to col. 12, line 14).

Regarding claim 18, Tuomi clearly teaches a first logical value (i.e. 0) assigned to represented to the foreground objects and a second logical value (i.e. 1) assigned to represented the background objects (see figures 22 and 27, col. 13 lines 56-64, col. 17, lines 12-15).

Regarding claim 20, Chen teaches each logical element (e.g. 218) being one or combination of hardware and software (see col.7, lines 19-23 and parts list on col. 13).

Regarding claim 21, Chen teaches the image capture device being a video capture device (cameras 11).

Regarding claims 22 and 27, Chen teaches the depth logic (218) configured to periodically provide a depth mask for a sequence of video frames captures by the video capture device (see col. 2, lines 35-49).

Regarding claims 23 and 28, Chen clearly teaches the image capture parameter being brightness (i.e. intensity) (see col. 7, lines 29-34).

Regarding claim 30, it claims the data for each pixel including distance information as recited in claim 11. Thus it is analyzed as previously discussed with respect to the claim 11 above.

4. Claims 1-5, and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gvili (Depth Keying, Proceedings of SPIE-IS&T Vol. 5006, 2003, pp 564-574) in view of Tuomi.

Regarding claim 1, Gvili discloses a method for differentiating between foreground objects and background objects within a scene being captured through an image capture device comprising:

- emitting a ray of light from a light source toward an object of the scene (i.e. generating a light wall, see para. 3.1, pp 566 - 567);
- opening and closing an aperture cover allowing access to a sensor of the image capture device for reflected light from the light source (i.e. deploying a fast image shutter in front of the CCD chip) (page 567, lines 4-5);
- and generating a depth mask identifying objects within a foreground region of the scene based upon the light captured during the set time (i.e. the collected light by each pixel is inversely proportional to the depth of the specific pixel, and normalized depth of pixel can be calculated) (see pages 568-569).

Gvili does not explicitly disclose the step of adjusting image capture device parameters according to bit values of the depth mask. However, Tuomi teaches a method of adjusting image capture device parameters according to bit values of the depth mask prior to capturing a subsequent corresponding image of the scene (see col. 13, lines 4 - 36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gvili by adjusting pixel values with relating to the depth value or a Z-value. The depth information in the Z-buffer 2606 is primarily used during the rendering process to determine which pixel is in the foreground (see figures 21 and 26, and col. 16, lines 48 – 57). The motivation to do so would have benefit of reducing the amount of memory required for each pixel

stored in a frame buffer because only the color values for the antialiasing mask operation need to be stored, thus reducing the size of the frame buffer (see col. 10, lines 57-61 of Tuomi).

Regarding claim 2, Tuomi teaches storing the depth mask in memory of the image capture device (i.e. provided a Z-buffer 1902 for storing the Z-values relating to the depth of the pixel; see col. 12, lines, 15 – 36).

Regarding claims 3 and 8, Gvili teaches pulsing infrared light from the light source (i.e. IR Laser diodes) (see page 567, lines 16-17).

Regarding claim 4, Gvili teaches the method operation of opening an aperture cover allowing access to a sensor of the image capture device includes, receiving reflected light from the objects within the foreground region. (i.e. a simple key of foreground objects can be generated by setting the depth measurement window to include the ranges, in which the foreground objects are located, see figure 4 of Gvili). In such setting, the camera captures light reflected from every object inside the depth measurement window, and ignores light reflected from objects outside the window (see figure 5 and para 3.2, pp 568).

Regarding claim 5, Gvili teaches identifying objects within the foreground region with a first bit value (1), and identifying object within the background region with a second bit (0) (see page 569, lines 9-17 and page 570, lines 2-6).

Regarding claim 7, Gvili teaches the image capture device parameters including focus (i.e. zoom) (see page 568, lines 1-3).

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gvili in view of Tuomi as applied to claim 1 above, and further in view of Shimada (US 2003/0025822).

Regarding claim 6, note the discussion of Gvili and Tuomi above. Gvili and Tuomi do not teach the step of determining an optimal amount of light based upon the depth mask and adjusting the aperture cover to allow the optimal amount of light into the image capture device. However, Shimada teaches adjusting the aperture cover to allow the optimal amount of light into the image capture device (see [0047] and [0050]). It would have been obvious to one of ordinary skill in the art at the time this invention was made to have use the aperture cover for adjusting the light as taught by Shimada to the camera of Chen as modified by Tuomi so that the brightness of the image is sufficient with the steady light rays, thus improve a quality of a photographed image (see [0009] and [0076] of Shimada).

6. Claims 15, 26, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Tuomi as applied to claims 9 and 25 above, and further in view of Sawano (US 6,677,967).

Regarding claim 15, note the discussion of Chen and Tuomi above. Chen and Tuomi do not teach the image of the scene being an image of a participant for use in an interactive game application. However, Sawano teaches video game system (see figure 1) for capturing video signals supplied from a given video source and processes data by using the image based on the captured video signals to create an image suited to user's preference (see col. 5, lines 15 - 24). Therefore, it would have

been obvious to one of ordinary skill in the art at the time the invention was made to have used the scene as game application as taught by Sawano to the scene of Chen as modified by Tuomi because it provides more enjoyable image creation from a user by combining the captured image with the original image on the screen (see col. 3, lines 40-44 of Sawano).

Regarding claim 26, Sawano teaches capture device (CPU 13) including video game console (see figures 1-2).

Regarding claim 31, it claims that the scene image data includes an image of a person and the image of the person being incorporated into a video game for interaction therein as stated in claim 15. Thus it is analyzed as previously discussed with respect to the claim 15 above.

7. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Tuomi as applied to claim 17 above, and further in view of Gvili.

Regarding claim 19, note the discussion of Chen and Tuomi above. Both do not teach a sensor in communication with the depth logic, the sensor configured to receive a light signal reflected from one of the foreground objects. However, Gvili teaches the a sensor (i.e. camera) in communication with the depth logic (i.e. software or hardware to generate depth key setting), the sensor configured to receive a light signal reflected from one of the foreground objects, the receipt of the light signal indicating a location corresponding to one of the foreground objects (see page 568, 3.2 "Depth Key Setting"). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a sensor as

taught by Gvili to the camera of Chen as modified by Tuomi so that it can provide separation of the foreground object from its background objects accurately (see page 564, Abstract of Gvili).

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Tuomi, and further in view of Kozlowski (US 2005/0105777).

Regarding claim 29, note the discussion of Chen and Tuomi above. Both do not teach that image capture device is a webcam. However, Kozlowski teaches the image capture device is a webcam (webcam 134). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a webcam as taught by Kozlowski to the camera of Chen as modified by Tuomi so that it may be used to capture a subject video sequence of a subject person and editing it (see pp [0024] and [0025]).

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Mori (US 5,455,685) is cited to teach an exposure control device for a video camera having automatic gain control by which both stability and instantaneous regulation of exposure can be satisfied in accordance with a photographing scene.
- Pan et al. (US 6,785,329) is cited to teach an automatic video object extraction that defines substantially precise objects.

- Long (US 7,161,634) is cited to teach adjusting the color depth of an RGB signal using error diffusion without the using an expensive frame buffer.
- Swain et al. (US 6,393,142) is cited to teach a method and apparatus provide a technique for generating a mesh based on an image view.

Inquiries

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kent Wang whose telephone number is 571-270-1703. The examiner can normally be reached on 7:30 A.M. - 5:00 PM (every other Friday off). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-270-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kent Wang
1 March 2007

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